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In [ ]: HARI PRASATH S  
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In [12]: class Account:  
    instance_count=0  
    @classmethod  
    def increment_instance_count(cls):  
        print('creating new account')  
        cls.instance_count+=1  
    def __init__(self,account_number,account_holder,opening_balance,account_type):  
        Account.increment_instance_count()  
        self.account_number=account_number  
        self.account_holder=account_holder  
        self.balance=opening_balance  
        self.type=account_type  
    def deposit(self,amount):  
        self.balance+=amount  
    def withdraw(self,amount):  
        self.balance-=amount  
    def get_balance(self):  
        return self.balance  
    def __str__(self):  
        return 'Account[' + self.account_number + ']- ' + self.account_holder + ',  
  
#Main:  
acc1=Account('123','John',10.05,'Current')  
acc2=Account('345','John',23.55,'Savings')  
acc3=Account('567','Pheobe',12.45,'Investment')  
  
print(acc1)  
print(acc2)  
print(acc3)  
  
acc1.deposit(23.45)  
acc1.withdraw(12.33)  
print("Balance : ",acc1.get_balance())  
  
creating new account  
creating new account  
creating new account  
Account[123]-John,Current Account = 10.05  
Account[345]-John,Savings Account = 23.55  
Account[567]-Pheobe,Investment Account = 12.45  
Balance : 21.17
```

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In [13]: print('Number of Account instance created : ',Account.instance_count)  
  
Number of Account instance created : 3
```

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In [14]: class CurrentAccount(Account):  
    def __init__(self , account_number , account_holder , opening_balance , over_limit):  
        super().__init__(account_number , account_holder , opening_balance , 'Current')  
        self.over_limit = -over_limit  
    def withdraw (self,amt):  
        if self.balance-amt < self.over_limit:  
            print("WARNING : withdraw would exceed your limit" )  
    def __str__(self):  
        return super().__str__() + ' overdraft limit:' + str(self.over_limit)
```

```
In [15]: class DepositAccount(Account):
        def __init__(self,account_number,account_holder,opening_balance,interest_rate):
            super().__init__(account_number,account_holder,opening_balance,'deposit')
            self.interest_rate=interest_rate
        def __str__(self):
            return super().__str__()+ ' interest_rate:'+str(self.interest_rate)
```

```
In [20]: class InvestmentAccount(Account):
        def __init__(self,account_number,account_holder,opening_balance,investment_type):
            super().__init__(account_number,account_holder,opening_balance,'investment')
            self.investment_type=investment_type
        def __str__(self):
            return super().__str__()+ ' investment_type:'+str(self.investment_type)
```

```
In [21]: acc1=CurrentAccount('123','John',10.05,100.0)
        print(acc1)
        acc2=InvestmentAccount('567','phoebe',12.64,'high risk')
        print(acc2)
        acc3=DepositAccount('345','John',23.55,0.5)
        print(acc3)
```

```
creating new account
Account[123]-John,current Account = 10.05 overdraft limit:-100.0
creating new account
Account[567]-phoebe,investment Account = 12.64 investment_type:high risk
creating new account
Account[345]-John,deposit Account = 23.55 interest_rate:0.5
```

```
In [22]: acc1.deposit(23.45)
        acc1.withdraw(12.33)
        print('balance:',acc1.get_balance())
```

```
balance: 32.290000000000006
```

```
In [23]: acc1.withdraw(300.00)
        print('balance:',acc1.get_balance())
```

```
balance: -267.71
```

```
In [24]: print('number of account instance created:',Account.instance_count)
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```
number of account instance created: 6
```

```
In [34]: class BalanceError(Exception):
        """ The Balance will be invalid """
        def __init__(self, account):
            self.account = account
        class AmountError(Exception):
            def __init__(self, account, msg):
                self.account = account
                self.message = msg
            def __str__(self):
                return 'AmountError (' + self.message + ') on ' + str(self.account)
```

```
In [38]: class Account:
    """ A class used to represent a type of account """
    instance_count = 0
    @classmethod
    def increment_instance_count(cls):
        print('Creating new Account')
        cls.instance_count += 1
    def __init__(self, account_number, account_holder, opening_balance, account_type):
        Account.increment_instance_count()
        self.account_number = account_number
        self.account_holder = account_holder
        self._balance = opening_balance
        self.type = account_type
    def deposit(self, amount):
        if amount < 0:
            print('You cannot deposit negative amounts')
            raise AmountError(account = self, msg = 'Cannot deposit negative amounts')
        else:
            self._balance += amount
    def withdraw(self, amount):
        if amount < 0:
            print('You cannot withdraw negative amounts')
            raise AmountError(self, 'Cannot withdraw negative amounts')
        else:
            self._balance -= amount
    @property
    def balance(self):
        """ Provides the current balance """
        return self._balance
    def __str__(self):
        return 'Account[' + self.account_number + '] - ' + \
            self.account_holder + ', ' + self.type + ' account = ' + str(self._balance)
```

```
In [39]: class CurrentAccount(Account):
    def __init__(self, account_number, account_holder, opening_balance, overdraft_limit):
        super().__init__(account_number, account_holder, opening_balance, 'current')
        self.overdraft_limit = -overdraft_limit
    def withdraw(self, amount):
        if amount < 0:
            print('You cannot withdraw negative amounts')
            raise AmountError(self, 'Cannot withdraw negative amounts')
        elif self.balance - amount < self.overdraft_limit:
            print('Withdrawal would exceed your overdraft limit')
            raise BalanceError(self)
        else:
            self._balance -= amount
    def __str__(self):
        return super().__str__() + 'overdraft limit: ' + str(self.overdraft_limit)
```

```
In [40]: class DepositAccount(Account):
    def __init__(self, account_number, account_holder, opening_balance, interest_rate):
        super().__init__(account_number, account_holder, opening_balance, 'deposit')
        self.interest_rate = interest_rate
    def __str__(self):
        return super().__str__() + 'interest rate: ' + str(self.interest_rate)
```

```
In [41]: class InvestmentAccount(Account):
        def __init__(self, account_number, account_holder, opening_balance, investme
            super().__init__(account_number, account_holder, opening_balance, 'inves
            self.investment_type = investment_type
        def __str__(self):
            return super().__str__() + ', type: ' + self.type
```

```
In [42]: acc1 = CurrentAccount('123', 'John', 10.05, 100.0)
acc2 = DepositAccount('345', 'John', 23.55, 0.5)
acc3 = InvestmentAccount('567', 'Phoebe', 12.45, 'high risk')
```

Creating new Account
Creating new Account
Creating new Account

```
In [43]: print(acc1)
print(acc2)
print(acc3)
```

Account[123] - John, current account = 10.05overdraft limit: -100.0
Account[345] - John, deposit account = 23.55interest rate: 0.5
Account[567] - Phoebe, investment account = 12.45, type: investment

```
In [44]: acc1.deposit(23.45)
acc1.withdraw(12.33)
print('balance:', acc1.balance)
print('Number of Account instances created:', Account.instance_count)
```

balance: 21.17
Number of Account instances created: 3

```
In [45]: try:
        print('balance:', acc1.balance)
        acc1.withdraw(300.00)
        print('balance:', acc1.balance)
    except BalanceError as e:
        print('Handling Exception')
        print(e)
```

balance: 21.17
Withdrawal would exceed your overdraft limit
Handling Exception
Account[123] - John, current account = 21.17overdraft limit: -100.0

```
In [46]: try:
        acc1.deposit(-1)
    except AmountError as e:
        print(e)
```

You cannot deposit negative amounts
AmountError (Cannot deposit negative amounts) on Account[123] - John, current ac
count = 21.17overdraft limit: -100.0

In []: